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Progress Report August-October 1973

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Volcanic activity and satellite-detected thermal
anomalies at Central American volcanoes

October 1973

Contents:

Summary Statements:

Overall Status
Recommendations
Expected Accomplishments
and Summary Outlook
Significant Results
Travel Summary

Addendum

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(E74-10068) VOLCANIC ACTIVITY AND
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Addendum

Santiaguito Volcanic Activity

Smithsonian Institution, Center for
Short Lived Phenomena

Activity Bulletins submitted
by the investigators

Summary Statements

Overall Status:

Preparations for second ground survey of active vents are completed. Observation of significant activity continues. No predawn thermal imagery is yet available from Skylab of the test area.

Recommendations:

The predawn imagery be given high priority.

Expected Accomplishments and Summary Outlook:

With the improving weather over the test area (the dry season has now begun), cloudiness over the volcanic chain should be significantly less. Thus we hope that this will enable predawn imagery to be taken. Our second ground survey is to begin in November, and will be in progress during much of the Skylab 4 mission. Thus our ground truth will be updated at or near the dates when imagery is possible. When imagery is obtained data analysis will ensue. Our previous report (E73-10937/WR) has shown that thermal anomalies exist at many volcanoes within the test area, and that many of these should be detectable from Skylab.

Significant Results:

A large nuée ardente eruption occurred at Santiaguito volcano, within the test area on 16 September 1973. Through our system of local observers, we have described the eruption, reported the event to the international scientific community (see appendix), mapped the extent of the area affected,

4

and sampled the new ash. A more extensive report on this event will be prepared. The eruption is an excellent example of the kind of volcanic situation in which satellite thermal imagery might be useful. The Santiaguito dome is a complex mass with a whole series of historically active vents. It's location makes access difficult, yet its activity is of great concern to large agricultural populations who live downslope. Santiaguito has produced a number of large eruptions with little apparent warning. In our earlier ground survey we identified large thermal anomalies at Santiaguito. We have no way of knowing whether satellite monitoring could have detected changes in thermal anomaly patterns related to this recent event, but the position of thermal anomalies on Santiaguito and any changes in their character would be relevant information.

Travel Summary:

None in this quarter, except short land trips by Central American observers.

EVENT	117-73	SANTIAGUITO VOLCANIC ERUPTION	24 SEPTEMBER 1973	1711.
<p>The following report is based on information received from Dr. Samuel Bonis:</p> <p>The Santiaguito Volcanic Dome erupted violently at 7 AM on 16 September 1973. Large volumes of ash were produced which have fallen as far away as Chiapas, Mexico. The ash cloud was apparently associated with a nuée ardente which descended the Dome from the Caliente vent to the valley of the Rio Concepcion. No damage to populated areas was reported as of 17 September. If the eruption is confirmed to have been a nuée ardente, then it is the second major such event this year from Santiaguito. On 19 April 1973, a large nuée descended from the caliente vent into the Rio Nima Segundo, one kilometer east of the Rio Concepcion. This April nuée travelled four kilometers and devastated an area of about three square kilometers. The nearest habitation south of Santiaguito in the direction of travel of the nuées is seven kilometers from the Dome. Santiaguito has been nearly continuously active since it first appeared in 1922. Most of the recent activity has consisted of dome extrusion and blocky lava flows. The 1973 nuée activity represents a significant change. Previously, large nuées at Santiaguito occurred only in a five-year period between 1929 and 1934.</p> <p>Note: Santiaguito is the name of the 1922 lava dome of the Santa Maria volcano, located at latitude 14°45.5'N., longitude 91°32.9'W. The height of the top above sea level is 3,768 meters. Santa Maria is a strato volcano with an explosion crater on the southwest slope and a lava dome.</p>			<p>EVENT NOTIFICATION REPORT</p> <p>TYPE OF EVENT: GEOPHYSICAL</p> <p>DATE OF OCCURRENCE: 16 SEPTEMBER 1973</p> <p>LOCATION OF EVENT: GUATEMALA.</p> <p>CENTRAL AMERICA</p> <p>REPORTING SOURCE: WILLIAM I. ROSE, JR. GEOLOGY DEPT., MICHIGAN TECHNICAL UNIVERSITY, HOUGHTON, MICHIGAN, USA</p> <p>SOURCE CONTACT: DR. SAMUEL BONIS INSTITUTO GEOGRAFICO NACIONAL, AV. DE LAS AMERICAS 5-76, ZONA B, GUATEMALA CITY, GUATEMALA</p> <p>SMITHSONIAN INSTITUTION CENTER FOR SHORT LIVED PHENOMENA 60 Garden Street CAMBRIDGE, MASSACHUSETTS 02138 UNITED STATES OF AMERICA CABLE: SATELLITES NEW YORK TELEPHONE: (617) 864-7941</p>	

EVENT	117-73	SANTIAGUITO VOLCANIC ERUPTION	27 SEPTEMBER 1973	1714.
<p>The following report was received ^{from} by Sam Bonis in a letter:</p> <p>"A large avalanche and nuée ardente issued from the foot of the Brujo lava flow at 7:10 a.m., 16 September 1973 and travelled for about 3 1/2 kilometers down the headwaters of the Rio Concepcion.</p> <p>"A one-kilometer-wide zone was devastated by the hot hurricane of ash that stripped and burned vegetation, and blew down or snapped off tree tops leaving a hot sand and ash deposit in excess of 1-meter thick in places. The toll of this avalanche turned into a mud flow that travelled many kilometers further down stream.</p> <p>"A mushroom-shaped ash cloud rose about 8,000 meters and rained mud 15 kilometers to the west, but it is doubtful if it ever reached Mexico, as previously reported.</p> <p>"All of the destruction in the area was limited to existing drainage channels and slopes uphill from the presently cultivated area."</p>			<p>EVENT INFORMATION REPORT: I</p> <p>TYPE OF EVENT: GEOPHYSICAL</p> <p>DATE OF OCCURRENCE: 16 SEPTEMBER 1973</p> <p>LOCATION OF EVENT: GUATEMALA</p> <p>CENTRAL AMERICA</p> <p>REPORTING SOURCE: WILLIAM I. ROSE, JR. GEOLOGY DEPT., MICHIGAN TECHNOLOGICAL UNIVERSITY, HOUGHTON, MICHIGAN, USA</p> <p>SOURCE CONTACT: DR. SAMUEL BONIS INSTITUTO GEOGRAFICO NACIONAL, AV. DE LAS AMERICAS 5-76, ZONA 13 GUATEMALA CITY, GUATEMALA</p> <p>SMITHSONIAN INSTITUTION CENTER FOR SHORT LIVED PHENOMENA 60 Garden Street CAMBRIDGE, MASSACHUSETTS 02138 UNITED STATES OF AMERICA CABLE: SATELLITES NEW YORK TELEPHONE: (617) 864-7941</p>	